BRINGING WETLANDS TO MARKET

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What's happening?

A project led by the Waquoit Bay National Estuarine Research Reserve (WBNERR) has received a $1.3 million grant to generate science and management tools with the potential to bring coastal wetlands into international carbon markets and incentivize investment in tidal wetland restoration and preservation.

This three-year project examines the relationship between salt marshes, climate change, and nitrogen pollution. Through a blend of targeted science, modeling, and broad stakeholder input, the team aims to generate information and tools that coastal decision makers can use to manage nitrogen pollution, design effective wetlands protection and restoration projects, and create policy frameworks and economic incentives to reduce greenhouse gas.

Anticipated tools include a carbon offset protocol and guidance for coastal wetland projects for use in Massachusetts and across the country, a model that developers, municipal officials, and nonprofits can use to estimate a project's potential to reduce greenhouse gas, and an analysis of the economic impact (positive or negative) of different wetland restoration and development scenarios.

Why this project?

Carbon dioxide, nitrous oxide, and methane are potent greenhouse gases that

Project scientists are measuring greenhouse gas fluxes from wetlands using a flux chamber coupled to automated field gas analyzers. Laser-based spectrometers enable the team to take the number of measurements necessary to capture changes in gas flux rates across different locations, times of day, and seasons.

contribute to global warming by trapping heat in the atmosphere. While it is well known that forests store large amounts of carbon from greenhouse gases, research indicates that coastal wetlands might capture and store carbon at rates three to five times greater than forests. Research also suggests that nitrogen pollution from septic systems, stormwater runoff, and airborne pollution can significantly compromise a wetland's ability to store carbon. In extreme cases, wetlands may even become sources of greenhouse gas and contribute to climate change.

Bringing wetlands into carbon markets requires better understanding of the flux of carbon and greenhouse gas in coastal wetlands and the influence of nitrogen on that flux. If data from the three-year study bears this out, it will strengthen incentives for reducing the amount of nitrogen pollution flowing into coastal wetlands by creating market-based incentives for restoration.

WAQUOIT BAY NATIONAL ESTUARINE RESEARCH RESERVE

RESTORE AMERICA'S ESTUARIES

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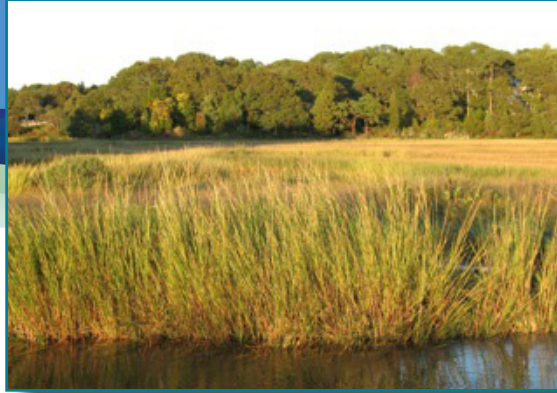
(Left) Analysis of vegetation, soil elevation relative to sea level, salinity, and rate of nitrogen input are all factors likely to affect a wetland's annual carbon storage. (Right) Falmouth Wastewater Treatment Plant. If this project determines that nitrogen pollution impacts a salt marsh's ability to store carbon from greenhouse gases, carbon markets may provide an economic incentive to reduce nitrogen loading by helping to defray the costs of wastewater infrastructure.

Transfer Projects at Waquoit Bay NERR

The Science Collaborative also supports the sharing of knowledge generated by the collaborative science projects we fund with other Reserves. Three such transfer projects, based on *Bringing Wetlands to Market,* are underway*:*

Site Specific Demonstration Connecting Wetlands Carbon to Coastal Managers: This project seeks to build understanding of blue carbon and its potential applications among the NERRS to build capacity to implement carbon offset projects. This is being accomplished through the integration of a site-specific demonstration at the Waquoit Bay NERR. Based on participant feedback, the team will develop a user-friendly template on blue carbon and its applications. They will conduct webinars and develop a video overview of blue carbon that describes incorporating it into coastal wetlands projects and management strategies.

New England Saltmarsh Symposium: This regional conference will facilitate professional sharing around research that explores the valuation of saltmarsh ecosystem services. This symposium will integrate findings from the the Wells NERR project, *Balancing Land Use Decisions*, which addresses the value of ecosystem services provided by riparian and wetland buffer lands. It will transfer knowledge about methods, instrumentation, and early findings. It also will link scientists conducting related research on ecosystem services of salt marshes and carbon and nitrogen cycling and managers in need of this science for wetland management.

A Pilot-Ready Blue Carbon Module for Teachers on the Estuary (TOTE): This project is building capacity of NERRS Education Coordinators to provide climate education, and to access Science Collaborative sponsored research for curriculum development. This is being accomplished through the co-development of a pilot ready TOTE module by Education Coordinators at the South Slough and Waquoit Bay NERR sites. The project includes a needs assessment survey of other NERRS Education Coordinators to determine whether there is interest in learning about the project and utilizing the module at their sites.